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A CASE OF ABSCESS OF THE LEFT FRONTAL LOBE OF THE CEREBRUM, WITH SPECIAL REFERENCE TO LOCALIZATION.

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On April 11, 1880, I was asked by Dr. J. Lewis Smith to see a case in consultation with himself and Dr. J. R. Leaming. The patient was a young married woman, aged about 28 years, who had formerly enjoyed good health and had borne several children. During the month of February one of these children had died after a severe illness, and she had undergone considerable fatigue. She seemed depressed, weak, and anæmic afterward.

About four weeks before the date of the consultation she complained of pain over the left eye. This was soon accompanied by swelling and exophthalmus, and on March 24th Dr. Knapp was called in and diagnosticated orbital (sub-periosteal) abscess. This was opened on March 26th by Dr. Knapp.

It was remarked that the pus was under great tension, and that it spurted out a considerable distance when released. Pain ceased at once, the exophthalmus disappeared, and the wound quickly healed. During the first few days of April all seemed going on well; the wound was healed; the patient was free from pain; she was taking tonics, and on the 3d made a call on a near neighbor.

During the night of April 3d and 4th, one week before my examination, she awoke with severe headache and vomiting; ever since she has lain abed, presenting the following symptoms: headache, chiefly mastoid and through the base of the skull; occasional vomiting; irregular respiration; irregular and very slow pulse, varying from 60 to 50 beats per minute; stupor and general feebleness. As negative points there were no symptoms about the eyes, objective or subjective, except a partial ptosis of the left upper lid (which had been incised); no fever, chills, convulsions, paralysis, aphasia; at no time had there been coma. The urine was free from albumen.

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Examination.—Patient was soporose, but could be roused by loud speaking; she answered questions as if half asleep, but in such a way as to leave no doubt as to the preservation of language. She put up both hands to the mastoid regions when indicating the seat of pain. A minute inspection showed no paralysis except about the left eye, whose upper lid drooped and whose internal rectus was inert. The pupil on the left site was not fully dilated, but it was a little wider than the right. The optic nerves appeared somewhat congested, and were dim at their periphery, but there was no actual choking. Patient appeared to feel pinching well everywhere. The thermometer showed no fever. The pulse varied from 53 to 66 beats per minute, and it was a reluctant,

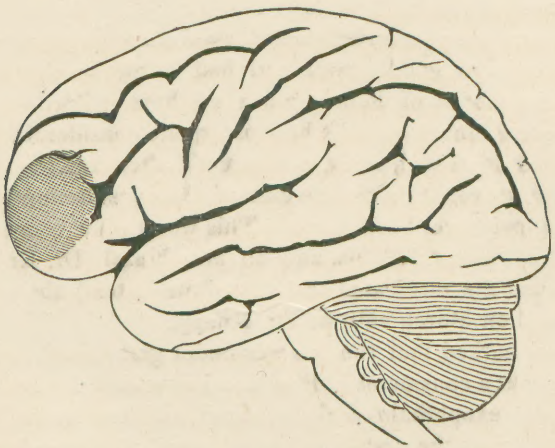

Fig. 1.—Apparent location of the abscess, drawn on an Ecker's diagram of the brain.

delusively full pulse, with no real strength. The breathing was easy and regular, but friends of the patient described quite well a Cheyne-Stokes breathing which they had observed. There was neither redness nor tenderness about the site of the orbital abscess.

I diagnosticated an abscess of the brain probably in the left frontal lobe, and expressed the opinion that the patient was in imminent danger. She died the next day in a comatose state; no new symptom having been observed.

It was then learned that for two years Mrs. F. had suffered from frequent attacks of headache, lasting several hours. The pain

was frontal, and sometimes extended along the nose and into the left temple. There had never been symptoms of chronic nasal catarrh.

The autopsy was made on April 13th, about thirty hours *post mortem*, in the presence of Drs. H. Knapp, J. R. Leaming, J. Lewis Smith (the attending physician) and Richard Wiener. We found a large abscess the size of an English walnut in the left frontal lobe. It seemed to lie wholly under the cortex cerebri, in the convolutions of the orbital lobule and in the second frontal convolution. Viewing the hemisphere from the side, the apparent posterior limit of the abscess was the anterior border of the lower part of the third frontal gyrus. Fig. 1. indicates the seat of the soft, fluctuating, bulging abscess. Its depth and penetration were not then determined, as it was thought best to harden the brain as a whole, before making sections.

The external connections and origin of the abscess were most interesting. There was only one point of adherence between the diseased frontal lobe and the dura mater, and that was over the orbital plate of the frontal bone immediately under the swollen frontal lobe. There the dura mater was thickened and adherent to the pia mater and cortex cerebri, forming the inferior wall of the abscess, over a space as large as a ten-cent piece (about 15 mm.). Under this patch of pachymeningitis the orbital plate of the frontal bone was necrosed and perforated ; a probe was easily passed into the orbit.

In the orbit, under its periosteum, pus was found, and a part of the roof and the inner wall of the orbit were carious. Careful dissection by Dr. H. Knapp showed disease of a similar kind in the ethmoidal cells and frontal sinus. I need say nothing more of the conditions of these parts and of the pathology of the orbital abscess, as the case has been fully reported from this point of view by Dr. Knapp.*

The appearance of the necrosed orbital plate and of the thickened, adherent dura mater, was precisely similar to what I have several times seen in cases of suppurative disease of the internal ear with cerebral abscess by contiguity. The genesis of the abscess must have been alike in the two situations.

In December, the brain having been sufficiently hardened in bichromate of potash solution, I imbedded it in Gudden's microtome, and made several horizontal sections through the whole brain with the view of demonstrating the relations of the abscess.

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These cuts showed that the abscess was of quite as large a size as at first supposed, almost perfectly globular in shape, measuring about 38 mm. in diameter. It contained ordinary pus, and was lined by a distinct membrane 1–2 mm. thick. The anterior, inferior and external limits of the abscess were thinned cortex and pia mater; superiorly, posteriorly, and internally, it was bounded by apparently normal white substance. The whole of the white centre of the frontal lobe, except a portion near the convexity of the hemisphere, was destroyed to within 10 mm. of the folds of the island of Reil, and about 8 mm. of the head of the nucleus cauda-

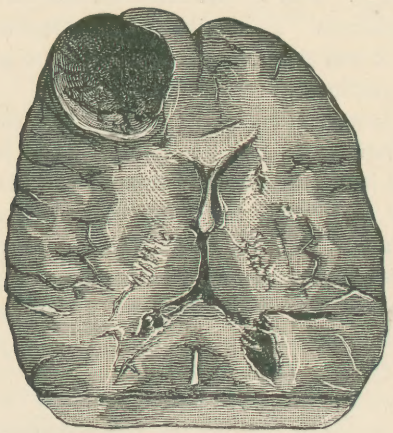

Fig. 2.—Relations of the abscess as shown in a horizontal section of the brain made at the level of Broca's speech-centre. Drawn from a photograph of the specimen. Occipital lobe cut off.

tus. The mass of white substance connecting the inferior and posterior part of the third frontal convolution and the anterior gyri of the island of Reil with the internal capsule, was uninjured.

This last fact is of capital importance in estimating the bearing of this case upon the current notions of cerebral localization.

The above description of the topography of the lesion, especially its posterior limitation, is made from the surface exposed by the lowest cut made, viz., one passing through the speech-centre of Broca, about 10 mm. above the apparent commencement of the fissure of Sylvius (pia still adherent). Fig. 2. is faithfully drawn from a photograph taken of this section-surface. The rest of the brain was healthy to the naked eye.

This remarkable case seems to me of much importance as a negative contribution to cerebral localization. It is in exact accord with recent experimental data, and with the *post-mortem* finding of the last ten years, that an abscess placed like this one should give rise to no motor symptoms, and should not cause aphasia. It is wholly within what are now called the inexcitable districts of the brain. The only symptoms present were the partial paralysis of the left third nerve (more immediately caused by the orbital abscess?) and signs of intracranial pressure. Yet it is important to note that in spite of the enormous pressure which must have existed there was no actual neuro-retinitis.

I have elsewhere reported another case of (smaller) abscess in precisely the same location (left frontal lobe) in which no symptoms referable to this lesion were present.*

On the other hand numerous autopsies are on record in which a smaller lesion (softening, hemorrhage, etc.), placed a centimetre further back in the left frontal lobe, involving the posterior part of the third frontal gyrus or the band of white substance between it and the nucleus caudatus, has given rise to severe symptoms, hemiplegia or aphasia, singly or combined.

In the paper just quoted I have described such cases.

*A contribution to the study of localized cerebral lesions. Transactions of the American Neurological Association, vol. ii, pp. 122–4, N. Y., 1877.